

What is claimed:

Sub
A1

1. A method of sequencing DNA fragments comprising:
placing a DNA sample within a buffer in separation apparatus;
applying an electric field across the separation apparatus to create a
bias in the buffer such that the DNA sample migrates from one end of the apparatus to
5 another end along a migration channel;
separating the DNA sample into fragments along the migration channel
within the buffer;
detecting fluorescent light emitted from the fragments along the
migration channel; and,
10 generating a full image of the separation apparatus and the separated
DNA fragments based on the detecting.

2. The method of claim 1 wherein the buffer is a gel.

3. The method of claim 1 wherein the buffer is a polymer
solution.

Sub
A2 4. The method of claim 1 wherein the separation apparatus
comprises at least one capillary tube.

5. The method of claim 1 wherein the separation apparatus
comprises a set of glass plates with lithographically etched channels.

6. The method of claim 1 wherein the detecting comprises
detecting using a full-width array scanner.

7. The method of claim 1 wherein the detecting comprises
detecting using an amorphous silicon two-dimensional image sensor array.

Sub
B2

8. The method of claim 1 wherein the detecting comprises detecting at a first time and then repeating the detecting after DNA fragments migrate through the gel for an additional period of time.

Sub A3 9. An apparatus for the sequencing of DNA comprising:
a separation apparatus operative to receive a DNA sample and facilitate migration and separation into fragments of the DNA sample along a migration channel within the apparatus;
5 a detector operative to detect light emitted the DNA fragments along the migration channels; and,
an image processor operative to generate image data representing a full image of the separation apparatus and the fragments.

10. The apparatus of claim 9 wherein the separation apparatus comprises:
at least one capillary tube;
a buffer; and,
5 a means for providing an electric field to create a bias between ends of the capillary tube.

11. The apparatus of claim 9 wherein the separation apparatus comprises:
a stacked pair of lithographically etched glass plates;
a buffer; and,
5 a means for providing an electric field to create a bias between ends of the glass plates.

12. The apparatus of claim 9 wherein the detector is a full-width array scanner.

Sub B4 13. The apparatus of claim 9 wherein the detector is a large area two-dimensional amorphous silicon image sensor array.

Sub A4 14. A system for sequencing DNA fragments comprising:

means for placing a DNA sample within a buffer in separation apparatus;

means for applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;

means for separating the DNA sample into fragments along the migration channel within the buffer;

means for detecting fluorescent light emitted from the illumination fragments along the migration channel; and,

means for generating a full image of the separation apparatus and the separated DNA fragments based on the detecting.

15. The system of claim 14 wherein the detecting means comprises a full-width array scanner.

16. The system of claim 14 wherein the detecting means comprises an amorphous silicon two-dimensional image sensor array.

17. The system of claim 14 wherein the illumination means comprises a laser that illuminates perpendicular to the direction of migration of the DNA fragments.

18. The system of claim 14 wherein the illumination means comprises a laser that illuminates along the direction of migration of the DNA fragments.

19. The system of claim 14 wherein the illumination means comprises a light emitting diode bar.

20. The system of claim 14 wherein the illumination means comprises a laser attached to the rear of the detector.